			DATE: 27 February 2017	TRANSMITTAL NO.: 0007			
TRA	ANSMITTAL OF DOCUMENTS FOR ACCEPTANCE	BY EPA					
TO:		FROM:					
Ms. Katrina Higg U.S. Environmen	gins-Coltrain tal Protection Agency Region 6	Patrick Appel EA Engineering, Science, and Technology, Inc., PBC					
SUBTASK NO.	DELIVERABLE Wetland Delineation Report Rev01 Wilcox Oil Company Superfund Site Remedial Investigation/Feasibility Study Bristow, Creek County, Oklahoma		NO. OF COPIES EPA: 1 Electronic Copy ODEQ: 1 Electronic Co				
	ACCE	PTANCE ACTION					
DOCUMENTS FO	DUND ACCEPTABLE (LIST BY SUBTASK NO.)	NAME/TITLE/SIGN	ATURE OF REVIEWER	DATE			

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27 February 2017

Ms. Katrina Higgins-Coltrain Task Order Monitor U.S. Environmental Protection Agency (EPA) Region 6 1445 Ross Avenue Dallas, TX 75202-2733

RE: Wetland Delineation Report

Wilcox Oil Company Superfund Site Remedial Investigation/Feasibility Study

Remedial Action Contract 2 Contract: EP-W-06-004 Task Order 0128-RICO-06GG

Dear Ms. Higgins-Coltrain:

EA Engineering, Science, and Technology, Inc., PBC (EA) is enclosing one electronic copy via email of the Wetland Delineation Report Rev01, for the above-referenced Task Order. Rev01 includes revisions based upon comments received from EPA on 6 February 2017. This document will also be included as an attachment it the Remedial Investigation Report.

An electronic copy is also being emailed to Mr. Todd Downham at Oklahoma Department of Environmental Quality (ODEQ).

Please do not hesitate to contact me at (972) 459-5038 if you have any questions.

Sincerely,

Patrick Appel Project Manager

cc: Todd Downham, ODEQ Project Manager (e-mail copy)

Tim Startz, EA Program Manager (letter only)

File



Wetland Delineation Report Wilcox Oil Company Superfund Site Bristow, Creek County, Oklahoma

Prepared for

U.S. Environmental Protection Agency Region 6 1445 Ross Avenue Dallas, Texas 75202-2733

Prepared by

EA Engineering, Science, and Technology, Inc., PBC 405 S. Highway 121
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February 2017 Revision: 01

EA Engineering, Science, and Technology, Inc., PBC	Revision: 01 February 2017
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LIST OF ACRONYMS AND ABBREVIATIONS

AOR Area of review

bgs below ground surface

EA Engineering, Science, and Technology, Inc., PBC

EPA U.S. Environmental Protection Agency

FAC Facultative

FACU Facultative Upland FACW Facultative Wetland

ft foot (feet)

in. inch(es)

lf linear feet

NAD83 North American Datum of 1983

NRCS National Resource Conservation Service

NWI National Wetlands Inventory

OBL Obligate Wetland

OHWM Ordinary High Water Mark

PEM Palustrine Emergent
PFO Palustrine Forested
PSS Palustrine Scrub-Shrub

SOW Scope of Work

TO Task Order

UPL Upland

WET1 Wetland 1
WET2 Wetland 2
WET3 Wetland 3
WET4 Wetland 4

WUS Waters of the United States

USACE United States Army Corps of Engineers USFWS United States Fish and Wildlife Service

USGS United States Geological Survey

1. INTRODUCTION

EA Engineering, Science, and Technology, Inc., PBC (EA) received the Statement of Work (SOW) for the Wilcox Oil Company Superfund Site (site) from the U.S. Environmental Protection Agency (EPA) under Remedial Action Contract No. EP-W-06-004, Task Order No. 0128-RICO-06GG. Under this Task Order (TO), EA is authorized to implement the remedial investigation/feasibility study for the Site. Prior to implementation of remedial activities, EA conducted a review and delineation of the wetlands and/or "waters of the United States" located within and adjacent to the site.

2. RESEARCH OF AVAILABLE DOCUMENTS

2.1 SITE BACKGROUND

The Wilcox Oil Company Superfund Site (site) is located on E0810 Road (aka West 221st Street), just east of Route 66 in Bristow, Creek County, Oklahoma (Figure 1). The site is an abandoned and demolished oil refinery and associated tank farm. The geographic coordinates of the approximate center of the site are approximately 35°50"31" north latitude and 96°23"02" west longitude. The site includes remnants of former oil refining operations and tank farms. For planning purposes, the site was divided into five major former operational areas: the Wilcox and Lorraine Process Areas, the East and North Tank Farms, and the Loading Dock Area (Figure 2). The area of review (AOR) for this report includes the Lorraine Process Area, Wilcox Process Area, East Tank Farm, and the southern portion of the North Tank Farm.

Prior to conducting the wetland delineation in the field, relevant site-specific data for the habitat evaluation area was reviewed to identify the likely location of potential wetlands and streams.

2.2 UNITED STATES GEOLOGICAL SURVEY TOPOGRAPHIC MAP

The United States Geological Survey (USGS) topographic map for the AOR (Figure 3) was used as a reference to identify possible wetlands and waterways on the property. Topographic maps identify elevations, forested areas, streams, ponds, roads and structures. The USGS topographic map depicts three blue-line streams including Sand Creek. In general, the topography of the site slopes to the south with two valleys oriented north-south associated with blue-line streams. The USGS topographic map also depicts a railroad on the site along the eastern boundary of the North Tank Farm and Lorraine Process Area.

2.3 SOIL SURVEY INFORMATION

The online National Resource Conservation Service's (NRCS) Web Soil Survey for Creek County was reviewed for the AOR (Figure 4). The Soil Survey identifies seven soil mapping units within the site and are identified in the Table 1. According to the Soil Survey, no hydric soil units occur within the site.

SOIL MAPPING UNIT SYMBOL HYDRIC SOIL **ACRES** Port silt loam, 0 to 1 percent slopes, occasionally flooded Not Hydric 0.18 Ve Port fine sandy loam, 0 to 1 percent slopes, occasionally flooded Vd Not Hydric 14.42 3.27 Dale clay loam, 0 to 1 percent slopes, rarely flooded Ma Not Hydric Bartlesville-Bigheart complex, 1 to 8 percent slopes, severely eroded BBgD3 Not Hydric 10.94 Ashport silt loam, 0 to 1 percent slopes, frequently flooded Ga Not Hydric 7.08 Bigheart-Niotaze-Rock outcrop complex, 1 to 8 percent slopes Not Hydric 78.99 **BNRD** Oil waste land-Huska complex, 1 to 8 percent slopes Oa Not Hydric 20.33 Source: Adapted from the USDA-NRCS Web Soil Survey

Table 1 Area of Review Soils

2.4 NATIONAL WETLAND INVENTORY MAP

EA's wetland scientist reviewed wetland data from the United States Fish and Wildlife (USFWS) Service's National Wetlands Inventory (NWI) Mapper. The NWI Map (Figure 5) identifies a total of nine NWI wetlands within the AOR, consisting of one freshwater forest/shrub wetland, three riverine wetlands, and five freshwater ponds within the AOR, which are each classified with a Cowardin designation. Table 2 below provides a list of the NWI wetland types identified within the site.

NWI CODE	COWARDIN DESIGNATION				
PFO1A	Palustrine Forested, Broad-Leaved Deciduous, Temporary Flooded				
R2UBH	Riverine, Lower Perennial, Unconsolidated Bottom, Permanently Flooded				
R4SBC	Riverine, Intermittent, Streambed, Seasonally Flooded				
PUBHh	Palustrine, Unconsolidated Bottom, Permanently Flooded, Diked/Impounded				
Source: Adapted from the NWI Map					

Table 2 NWI Wetlands within Site Boundary

3. METHODOLOGY

The wetland delineation was conducted in accordance with the "Routine Determination" procedures outlined in the 1987 Corps of Engineers Wetland Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0) (U.S. Army Engineer Research and Development Center 2010). This approach is based on the presence of three parameters (i.e., wetland hydrology, hydric soils, and hydrophytic vegetation) including indicators, delineation guidance, and other information that is specific to the Great Palins Region. The United States Army Corps of Engineers (USACE) technical guidance for identifying wetlands requires that a

positive wetland indicator be present for each of the three identified parameters except in limited instances identified as an atypical situation.

3.1 HYDROPHYTIC VEGETATION

Hydrophytic vegetation is defined in the USACE manual as a community of macrophytes that occurs in areas where inundation or soil saturation is either permanent or of sufficient frequency and duration to influence plant occurrence. A plant-community approach to evaluate vegetation is used and therefore hydrophytic vegetation decisions are based on the community of plant species growing in a particular area rather than the presence or absence of particular indicator species. Common wetland plant species have been categorized regionally by the USACE in the 2016 National Wetland Plant List (Lichvar, 2016). Each plant is classified into one of five categories as follows:

- Obligate (OBL) = Greater than 99 percent estimated probability of occurring in wetlands.
- Facultative Wetland (FACW) = 67 to 99 percent estimated probability of occurring in wetlands.
- Facultative (FAC) = 34 to 66 percent estimated probability of occurring in wetlands.
- Facultative Upland (FACU) = 1 to 33 percent estimated probability of occurring in wetlands.
- Upland (UPL) = less than 1 percent estimated probability of occurring in wetlands.

Plants that have an indicator status of OBL, FACW, or FAC are considered to be typically adapted for life in anaerobic soil conditions. When the dominant species in a plant community are typically adapted for life in anaerobic soil conditions, hydrophytic vegetation is present. Several indicators may be used to determine whether hydrophytic vegetation is present on a site; however, the presence of a single individual of a hydrophytic species does not mean that hydrophytic vegetation is present.

Evaluation of the vegetation begins with a rapid field test for hydrophytic vegetation to determine if there is a need to collect more detailed vegetation data. If the area is not dominated solely by OBL and FACW species, the standard dominance test is performed to determine if more than 50 percent of the dominant species are OBL, FACW, or FAC. Some wetland plant communities may not be considered hydrophytic based only on dominant species. Therefore, in those cases where indicators of hydric soil and wetland hydrology are present, the vegetation would be reevaluated with the prevalence index test taking into account non-dominant plant species as well. A plant community is considered hydrophytic if one of these three tests are passed.

3.2 HYDRIC SOILS

Hydric soils are soils that are saturated, ponded, or flooded long enough during the growing season to develop anaerobic conditions in the upper portion of the soil column (typically within the upper 18 in.). The prolonged presence of water results in the chemical reduction of elements, particularly iron and manganese. Reduced soils often exhibit a gray (or "gleyed") color that reflects either the leaching of elements or the presence of reduced elements (again, generally iron and manganese).

Hydric soils are often characterized by bright mottles, sometimes called redoximorphic features. Mottles are an indication of incomplete saturation. They typically represent isolated pockets where elements (mainly iron) have remained oxidized. Another feature of hydric soils is a low matrix chroma in the diagnostic zone, which is typically identified as the upper 18-inches of the soil layer, but may vary. For mineral hydric soils, the diagnostic zone typically must have a matrix chroma of two or less (for soils with mottles), or a matrix chroma of one or less (for soils without mottles). To make this determination, soil cores are collected in the field in suspected wetland areas and the soil colors are compared to a Munsell Soil Color Chart. Other examples of field indicators for hydric soils include, but are not limited to, high organic content, histic epipedons, sandy redox, and/or depletions and are defined in the Regional Supplement to the Wetland Delineation Manual.

3.3 WETLAND HYDROLOGY

Wetland hydrology supplies the moisture required to support wetland vegetation and also creates the conditions necessary for the formation of hydric soils. Primary indicators of wetland hydrology include, but are not limited to, observed inundation or saturation, watermarks, drift deposits, sediment deposits, and water stained leaves. Secondary indicators of wetland hydrology include, but are not limited to, drainage patterns, soil cracks, crayfish burrows, and the FAC-Neutral test. The FAC-Neutral test involves comparing the number of OBL and FACW plant species to the number of FACU and UPL plant species, with FAC species being neutral. If 50 percent or more of the plant species are OBL or FACW, the FAC-Neutral test is considered a secondary indicator of wetland hydrology. An area must contain at least one primary indicator or two secondary indicators of wetland hydrology for the criterion of wetland hydrology to be met.

3.4 STREAM CHANNELS

In addition to identifying wetlands, stream channels were flagged that would likely be considered jurisdictional Waters of the U.S. (WUS) stream channels were identified by the presence of a defined bed and bank, as well as a defined ordinary high water mark (OHWM). Furthermore, identified stream channels were classified into one of three categories: perennial stream channels that typically flow year-round, intermittent stream channels that only flow seasonally, and ephemeral stream channels that typically flow less than seasonally. Ephemeral channels receive hydrology from surficial sources such as runoff from surrounding uplands during and immediately following precipitation events and/or snow melt (i.e., do not have a direct

connection to groundwater and are not hydraulically connected to wetlands). Desktop information such as USGS maps, soil surveys, NWI maps, and other materials were used to assist in classifying stream channels in addition to observations made during the site visits.

3.5 FIELD DATA COLLECTION

Locations for collection of data were established on-site to evaluate the presence or absence of jurisdictional wetlands/waterways, and to demonstrate the typical characteristics of uplands and wetlands along the line of delineation. Surrounding vegetative species and hydrologic indicators were observed at the sample locations. EA personnel collected soil to a depth of approximately 16 in. or until refusal was encountered to observe soil conditions and classify the soil as either hydric or non-hydric. Routine wetland determination data sheets were used to summarize observations on vegetation, soils, and hydrology for both the wetland and upland sample plots. Copies of these Wetland Data Sheets are included in Appendix B. Additionally, on-site photographs of the wetlands and streams identified were collected in the field and are included in Appendix C.

3.6 FIELD DELINEATION

On 19 through 22 October 2016, EA's wetland scientist and engineer performed a field delineation of the site and immediate surroundings (defined as the AOR) in order to evaluate whether wetlands and/or waterways were present. The AOR encompasses approximately 135 acres including the Lorraine Process Area, the Wilcox Process Area, the East Tank Farm, and the southern portion of the North Tank Farm (Figure 2). The field delineation of WUS consisted of identifying the limits of the wetlands and waterways with pink and black flagging, which were numbered sequentially. Wetland flag locations were located in the field with a handheld Trimble GeoXT GPS unit with sub-meter horizontal accuracy and collected in the North American Datum of 1983 (NAD83), Oklahoma State Plane North Coordinate System. The field-mapped wetland/upland boundaries are shown on Figures 6 through 9 which are overlaid onto an aerial photograph. Table 3 presents a summary of systems identified.

SYSTEMS	TYPE	SIZE (ac)	LENGTH (LF)
WET1	PFO/PEM	0.06/0.03	
WET2	POW/PSS	0.09/0.15	
WET3	PEM	0.24	
WET4	PSS	0.02	
WUS1	Intermittent		130
WUS2	Perennial		2,110
WUS3	Intermittent		335
WUS4	Intermittent		70
WUS5	Perennial		2,315
WUS6	Perennial		235
WUS7	Ephemeral		3,075
ac – acres lf – linear feet			
II – Illiear feet			

Table 3 Systems Identified Within the Area of Review

4. SYSTEMS IDENTIFIED

4.1 WETLAND 1

Wetland 1 (WET1) is a small isolated wetland located in the southeastern portion of the Wilcox Process Area (Figure 7). The primary source of hydrology for WET1 is believed to be surficial runoff and surface water was observed in WET1 during the delineation. WET1 contains palustrine emergent (PEM) vegetation in the southwest portion and palustrine forest (PFO) vegetation in the northeast portion of the wetland. A wetland data point was collected in the PEM portion of the wetland. The PEM portion of WET1 consists of predominantly hydrophytic vegetation including narrow leaf cattail (*Typha angustifolia*). The PFO portion of WET1 was dominated by black willows (*Salix nigra*) and green ash (*Fraxinus pennsylvanica*). WET1 did not display hydric soils, however much of the Wilcox Process Area was an industrial site and it is likely that the soils in this area have been disturbed.

4.2 WETLAND 2

Wetland 2 (WET2) is located in line with WUS3 and WUS7 and was likely man made by excavating the lower portion of WUS7 and building a dam to create a farm pond (Figure 7). WET2 is a perennial open water with a palustrine scrub-shrub (PSS) fringe wetland. At the time of the delineation water levels were low exposing an unvegetated mud flat. Hydrophytic vegetation within the PSS portion of WET2 includes water purslane (*Ludwigia palustris*), black willow, button bush, sweetscent (*Pluchea odorata*). The soil at the WET2 data point was saturated at the surface and the water table was observed at 12 in. below ground surface (bgs). The soil profile within WET2 displayed a depleted matrix. Unlike other impoundments located within the AOR, WET2 is likely jurisdictional since it was created by impounding WUS7 (discussed in Section 4.11) and would be considered an in-line feature.

4.3 WETLAND 3

WET3 is located north of E0810 Rd within the North Tank Farm Area (Figure 8). WET3 is a system of vegetated drainage ditches that connect to WUS1 through a culvert under E0810 Rd. WET3 is dominated by hydrophytic including black willow, narrow leaf cattail, and common boneset (*Eupatorium perfoliatum*). A complete soil profile within WET3 could not be obtained due to the presence of a restrictive layer at 6 in. bgs. Hydrology for WET3 included surface water and inundation visible from aerial imagery.

4.4 WETLAND 4

WET4 is small PEM wetland located along WUS5 (Figure 9). The soil matrix within this area had a chroma value of less than two as well as redox features in the pore linings. Saturation was observed at 4 in. bgs and the water table was observed at 12 in. bgs. WET4 was dominated by hydrophytic vegetation including river birch (*Betula nigra*), slippery elm (*Ulmus rubra*), American sycamore (*Platanus occidentalis*), horsetail (*Equisetum* spp.) and marsh fleabane (*Pulchea odorata*).

4.5 WUS 1

WUS1 is an intermittent channel originating at E0810 Rd (Figure 6) west of the Lorraine Process Area. The banks of WUS1 are highly eroded and the channel contained large amounts of trash and debris. WUS1 was likely at one time an ephemeral channel, however due to erosion from high flows, WUS1 has been cut down. Its connection to ground water may be determined in future investigations. WUS1 conveys flow in a southerly direction where it contributes to WUS2.

4.6 WUS 2

WUS2 is a wide, low gradient perennial channel that generally follows along the southwestern boundary of the site (Figure 6). WUS2 is shown on USGS topographic maps as a blue line stream and is identified as Sand Creek (Figure 3). Approximately 2,110 ft along left bank of WUS2 was delineated. Channel widths were collected at various data points and used in conjunction with aerial imagery to approximate the right bank. The dominate substrate of WUS2 is hard clay with finer materials observed in bars located along the banks throughout the channel. Vegetation along WUS2 included a mix of native and non-native species including American sycamore, catalpa (*Catalpa* spp.), Chinese privet (*Ligustrum sinense*), cardinal flower (*Lobelia cardinalis*), beefsteak (*Perilla frutescens*), green briar (*Smilax rotundifolia*), and multiflora rose (*Rosa multiflora*). Wildlife observed included small fish, frogs and turtles. Pollutants observed within WUS2 include trash, debris, and a petroleum odor.

4.7 WUS 3

WUS3 is an intermittent channel located in the southern portion of the Wilcox Process Area (Figure 7). WUS3 originates below a concrete apron at the south end of WET2 and flows south to connect with WUS2. WUS3 is approximately 3 ft wide and 6 ft deep with an average water

depth of less than 6 in. The banks of WUS3 are very steep due to erosion during high flow events.

4.8 WUS 4

WUS4 is a low gradient intermittent channel located in the southern portion of the Wilcox Process Area originating from a seep below WET2 (Figure 7). WUS4 is approximately 3 ft wide and 2 ft deep with less than 1 in. of water at the time of the field delineation. WUS4 has a muck bottom and an orange sheen indicating the presence of iron.

4.9 WUS 5

WUS5 is a low gradient perennial channel located in the East Tank Farm Area along the eastern portion of the AOR (Figure 6). WUS5 is shown on USGS topographic maps as a blue line stream (Figure 3) and originates from an impoundment located north of the site. At the time of the field delineation, a culvert that carries overflow from the impoundment to WUS5 was being replaced. A large storm earlier in the year had damaged the culvert and impoundment dam. Signs of erosion due to the high flows during the storm were observed along the upper reach of WUS5. WUS5 is approximately 2,315 linear ft and an average of 25 ft wide. The substrate of WUS5 consisted of silty sand and bedrock in the upper reach and hard clay in the lower reach. Debris and a sheen were observed throughout WUS5.

4.10 WUS 6

WUS6 is small, low gradient perennial channel that originates offsite and conveys flow to WUS5 near the southwest corner of the AOR (Figure 6). WUS6 is approximately 5 ft wide and 4 ft deep with approximately 1 ft of water.

4.11 WUS 7

WUS7 is an ephemeral channel that flows north to south though the Wilcox Process Area (Figure 6). WUS7 is shown on USGS topographic maps as a blue line stream, however due to dense overgrowth could not be field delineated. WUS7 was instead delineated using aerial imagery and the USGS topography. WUS7 originates north of the AOR and flows south to connect with WET2. It is likely that WUS7 and WUS3 were one stream prior to the impoundment that created WET2.

5. CONCLUSION

The seven WUS and three wetlands identified within the AOR, in EA's opinion, either exhibited characteristics of regulated waterways or all three wetland parameters as defined in the 2012 Regional Supplement Manual. These areas were identified in the field and mapped on the Figures 6 through 9. One wetland, WET1, displayed only two wetland parameters and therefore may not be considered jurisdictional by the USACE. WET1 did not display hydric soils, however soils throughout the AOR are highly disturbed from historic processing activities and may be considered problematic soils.

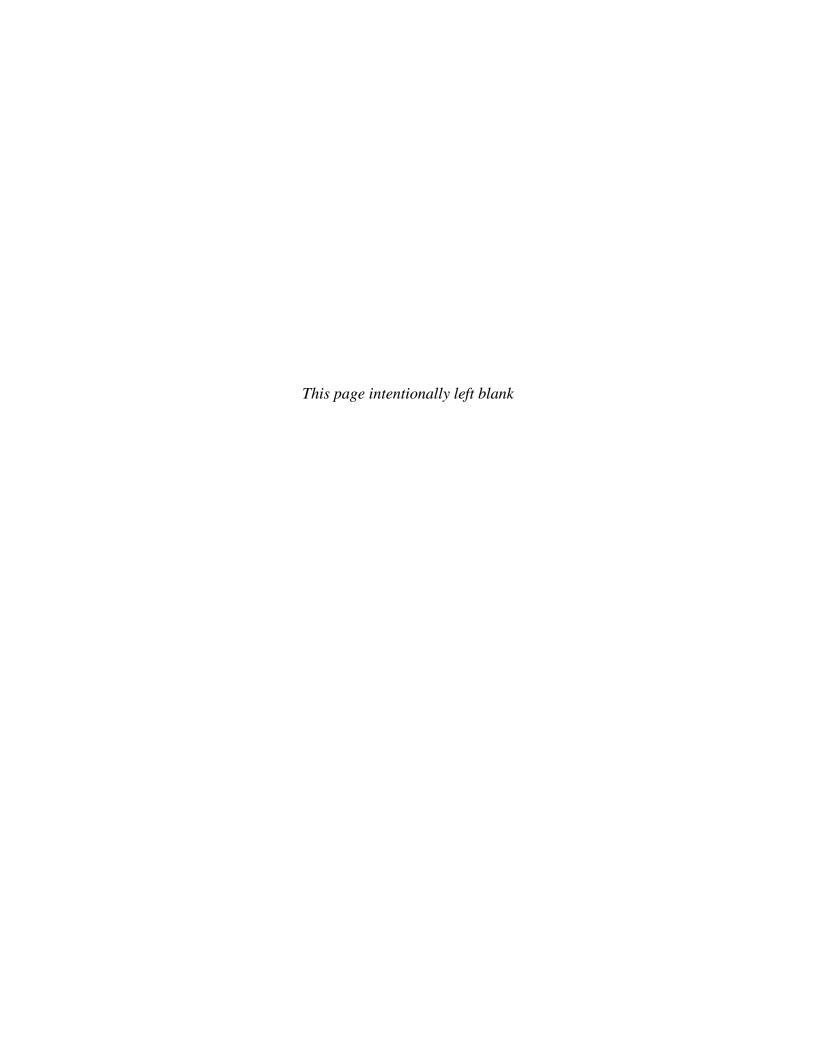
During the delineation, several non-jurisdictional features were observed within the AOR. Non-jurisdictional features included four impoundments in the East Tank Farm Area and several erosional features in the eastern portion of the East Tank Farm that likely resulted from the large storm earlier in 2016. Additionally, several impoundments and one wetland shown on the NWI map were not observed during the delineation. NWI maps are created using high altitude imagery and wetlands are identified by vegetation, visible hydrology, and geography. Due to the limited accuracy, ground inspection of NWI maps is necessary to determine their accuracy. During the field investigation, four impoundments were identified, only one of which corresponds to an NWI impoundment. The remaining impoundments shown on the NWI map were not observed.

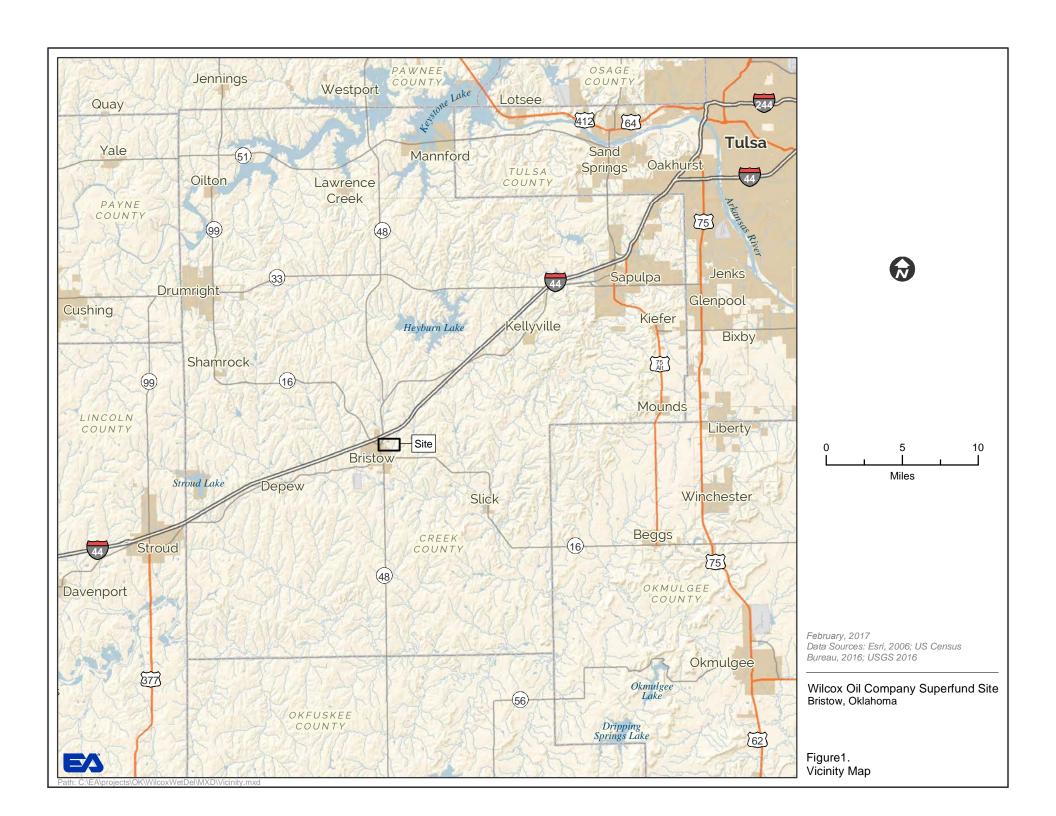
It is EA's professional opinion that there are jurisdictional nontidal wetlands and WUS present within the AOR. However, the USACE is the federal agency that determines the official jurisdictional status of wetlands/waterways. Should it be necessary, this report, including appendices, can be submitted to the USACE to assist with preliminary or final Jurisdictional Determination.

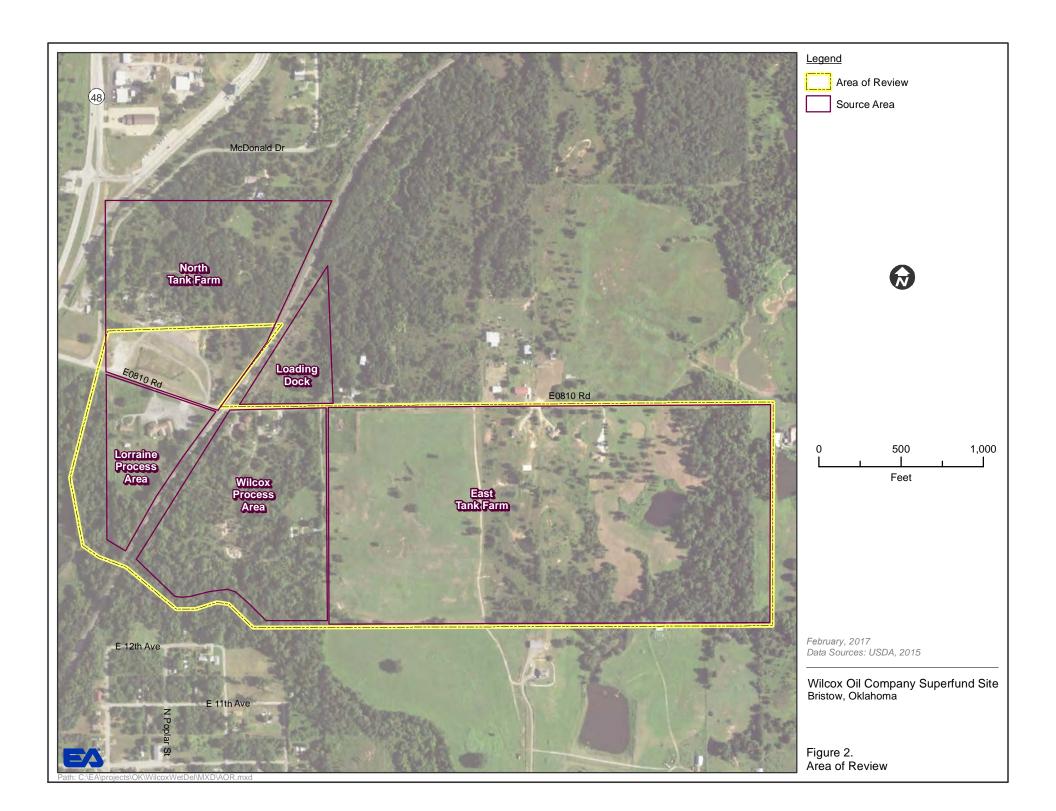
6. REFERENCES

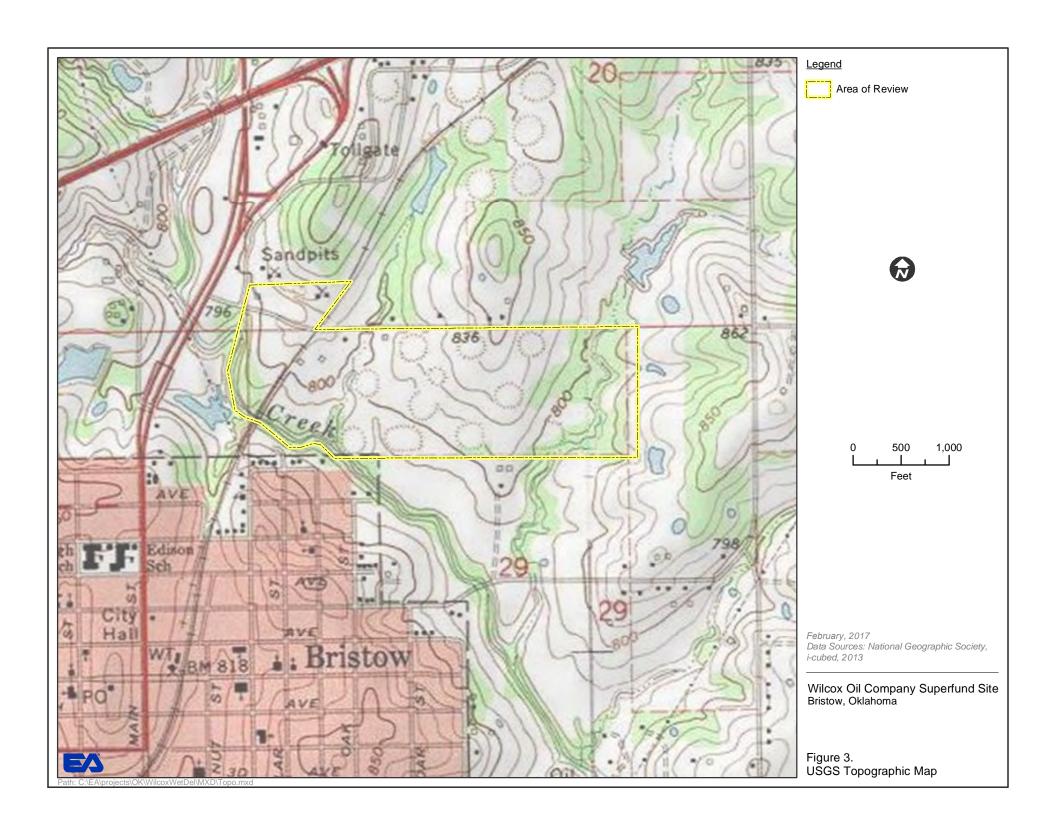
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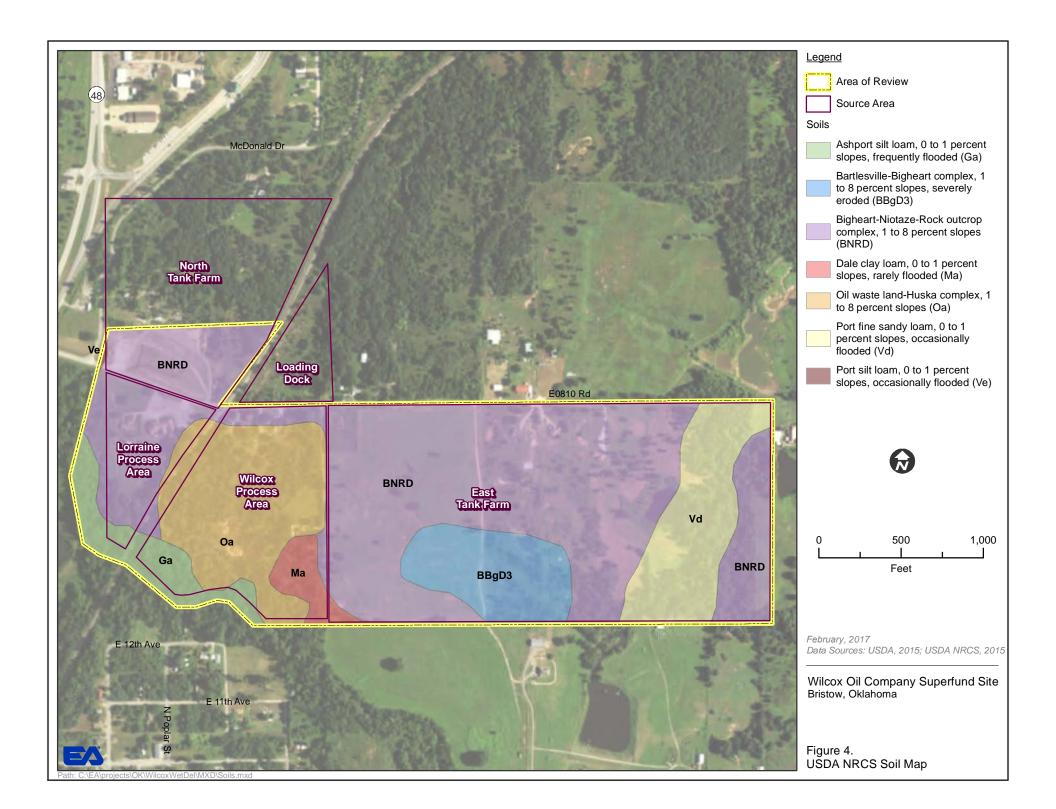
Appendix A FIGURES

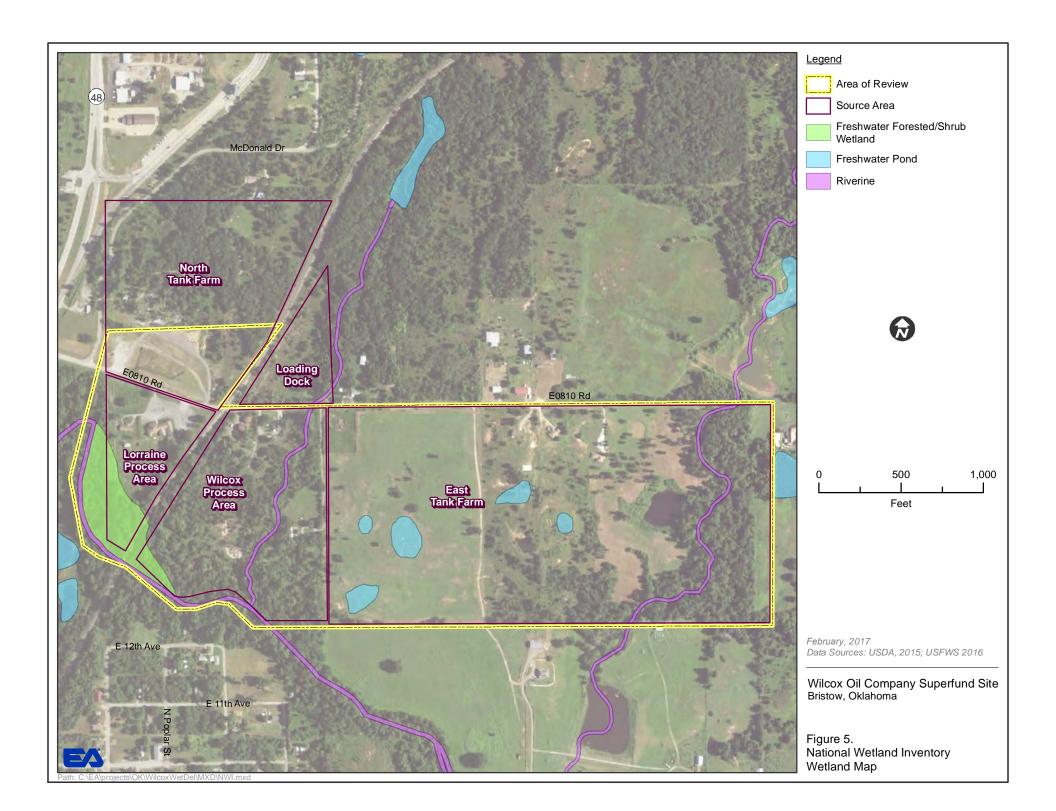


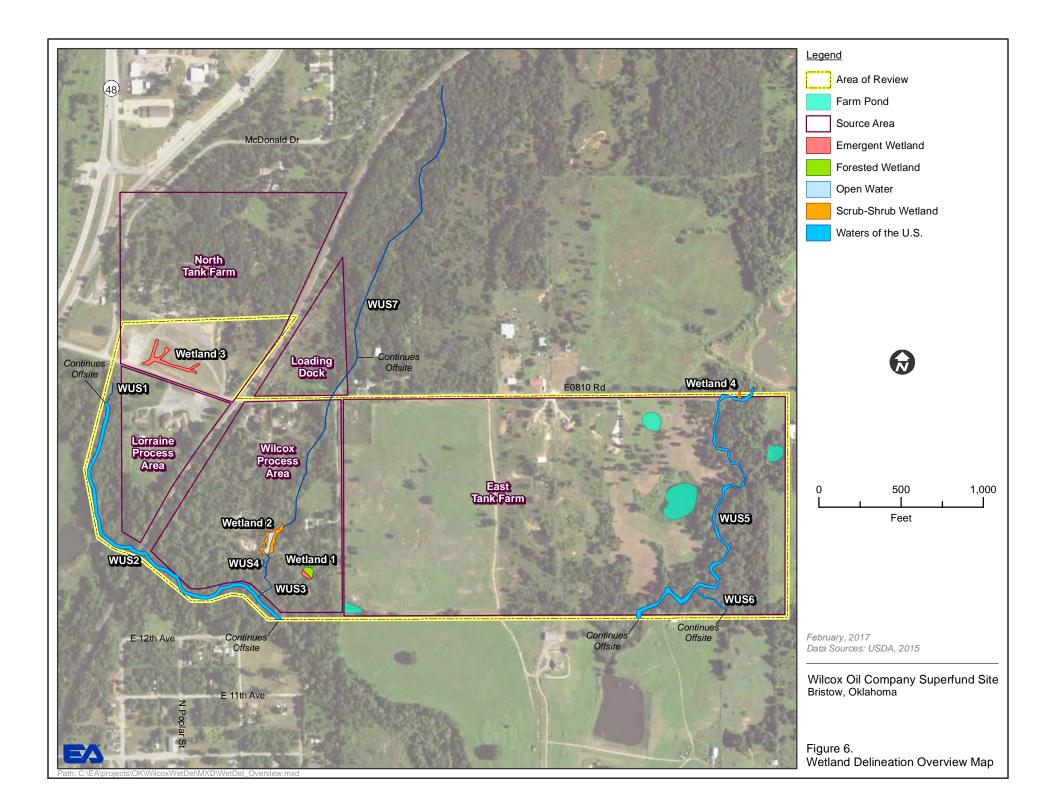


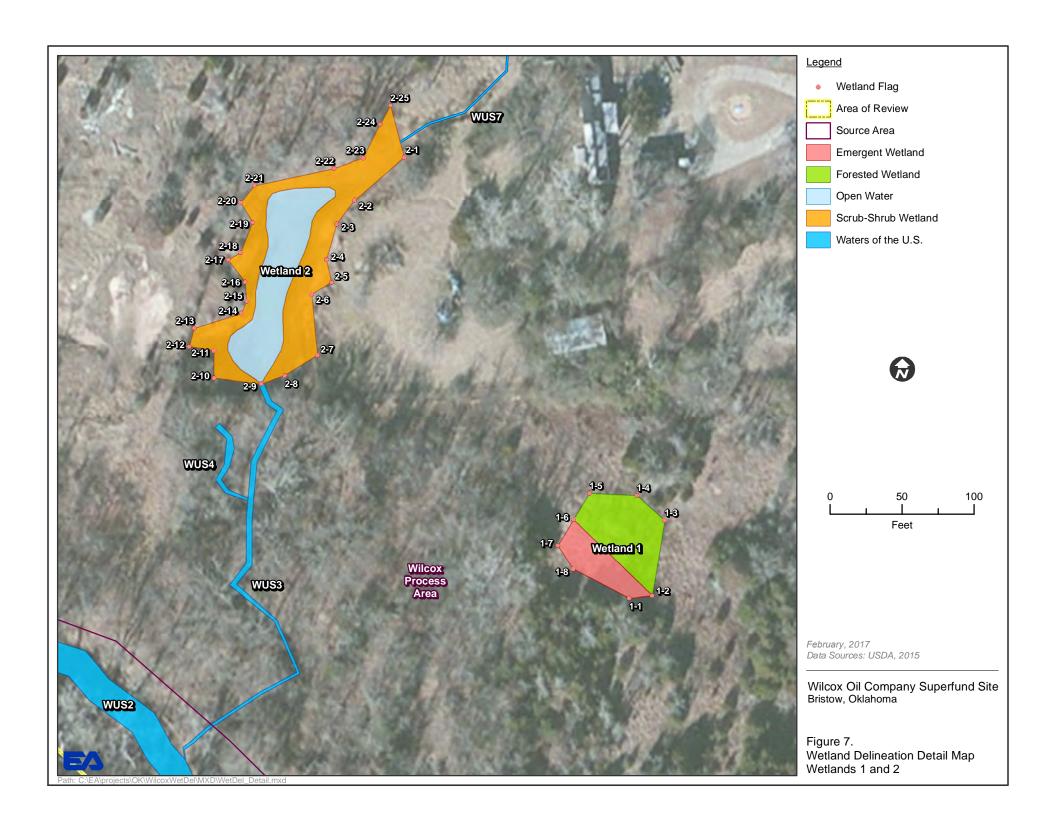


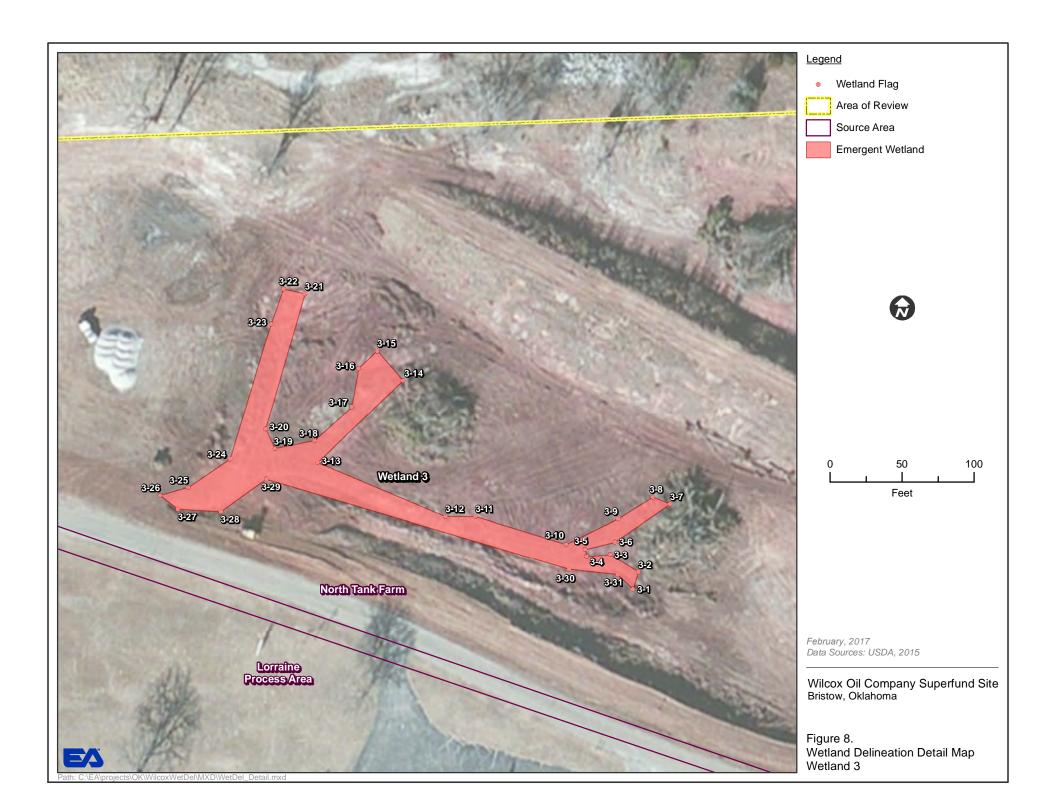


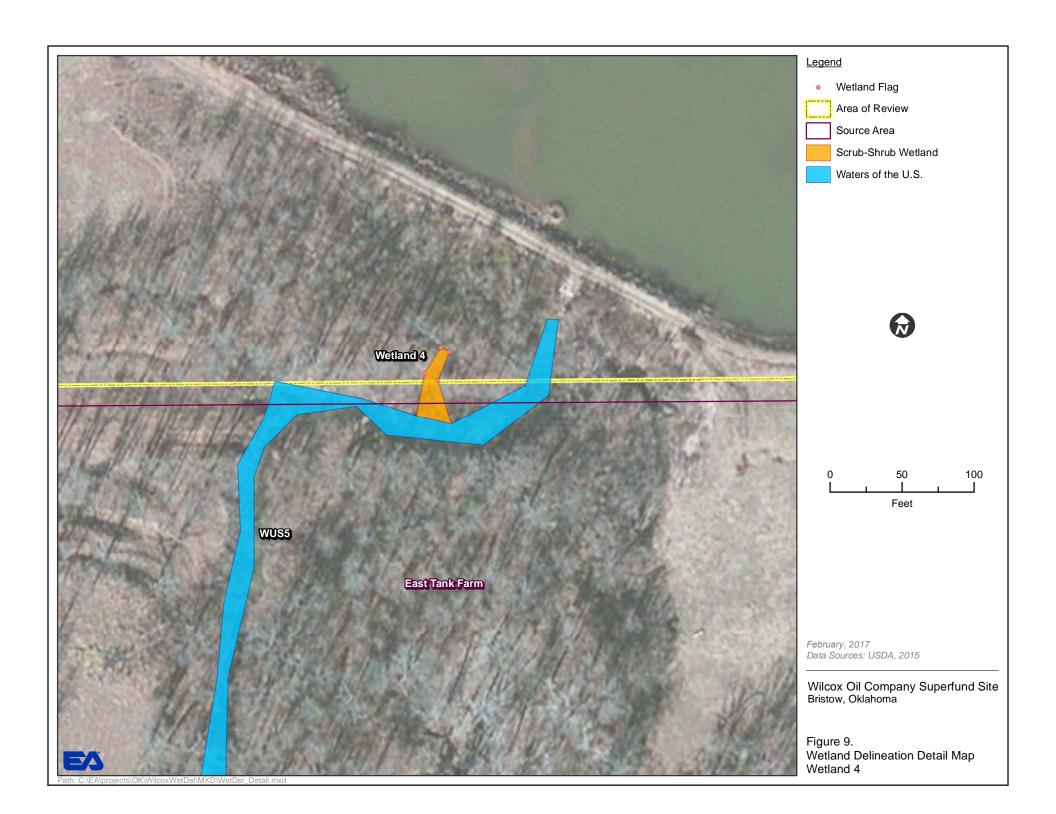




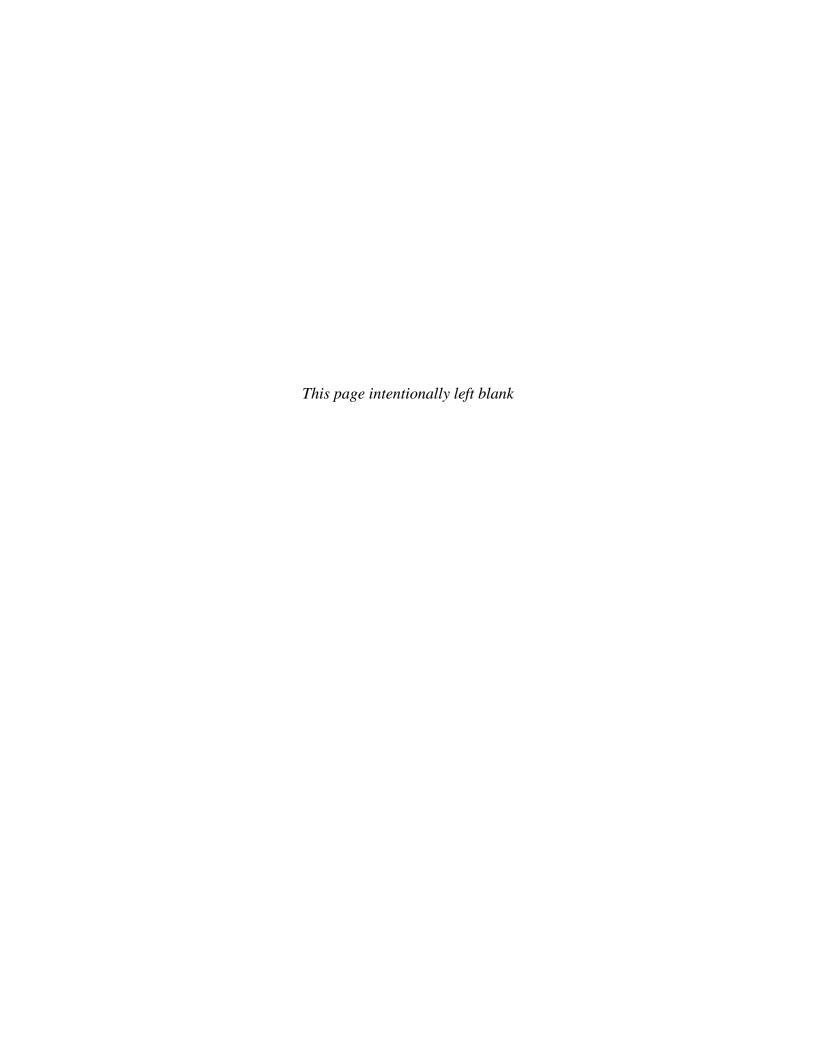








Appendix B WETLAND DATA SHEETS



WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Wilcox Superfund Site	(City/Co	unty:	Bristow		Sampling D	ate: 9/20/20	16
Applicant/Owner: EPA					State: OK			
Investigator(s): K. Rigney, S. Gilrein					nge:			
Landform (hillslope, terrace, etc.): Hilly							Slope (%):	0
Subregion (LRR): LRR J (Southwestern Prairies)								
Soil Map Unit Name: Dale clay loam, 0 to 1 percent slopes, ra								
Are climatic / hydrologic conditions on the site typical for this								
Are Vegetation, Soil X, or Hydrology signature.					Normal Circumstances"		s X No	0
Are Vegetation, Soil, or Hydrology na					eded, explain any answe			
SUMMARY OF FINDINGS – Attach site map s								s, etc.
Hydrophytic Vegetation Present? Yes X No Hydric Soil Present? Yes No	X			Sampled		N.		
Wetland Hydrology Present? Yes X No				a wetian	nd? Yes X	NO		
Remarks:								
WET1 is an isolated wetland. Due to pa	ast site	use,	soils	s throu	ghout are signific	cantly dis	sturbed.	
VEGETATION – Use scientific names of plant	s							
Table 1 and	Absolute	Domir	nant li	ndicator	Dominance Test worl	sheet:		
	% Cover				Number of Dominant S			
1. None					That Are OBL, FACW,	or FAC		(A)
2					(excluding FAC-):			(A)
3					Total Number of Domir Species Across All Stra			(B)
4								(D)
Sapling/Shrub Stratum (Plot size: 25'		= Total	Cove	r	Percent of Dominant S That Are OBL, FACW,		00	(A/B)
1. None								(,,,,)
2					Prevalence Index wor			
3					Total % Cover of:			
4					OBL species			
5					FAC species			
Herb Stratum (Plot size: 5'		= Total	I Cove	r	FACU species			
1 Typha angustifolia	30	Υ	(OBL	UPL species			
2. Aster spp.	5	N			Column Totals:			
3. Carex spp.	10	N						
4. Persicaria pensylvaniva	10	N	<u>F</u>	FACW	Prevalence Index			
5					Hydrophytic Vegetati			
6					1 - Rapid Test for ✓ 2 - Dominance Test		regetation	
7		-			3 - Prevalence Ind			
8					4 - Morphological	Adaptations ¹	(Provide sup	porting
9					data in Remark	s or on a sep	arate sheet)	
10		Total			Problematic Hydro	phytic Vegeta	ation¹ (Explai	n)
Woody Vine Stratum (Plot size: 5') 1. None		= Total			¹ Indicators of hydric so be present, unless dist			nust
2					Hydrophytic			
0. D 0 1. H 1. O 1. 15		= Total	I Cove	r	Vegetation Present? Yes	es X N	No	
% Bare Ground in Herb Stratum 45 Remarks:					. rooth: 16			
	vogata	ntion	\\/i+h	in DEC) includes blocks	willow a	roon ook	
Portion of WET1 is a PFO. Hydrophytic sycamore, and	vegeta	atiOH	vvilii	111 P F C	Includes black	willow, gr	cen asii	,

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SOIL Sampling Point: WET1

Profile Desc	cription: (Describ	e to the de	pth needed to docu	ment the	indicator	or confir	m the absence	of indicators.)			
Depth	Matrix			x Feature		. 2					
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks			
0-4	5YR6/4	95	5YR5/8	5	<u> </u>	M	Fine sand	some clay, moist			
4-16	5YR5/8	90	2.5YR4/8	10	C	М	Fine sand	some clay, moist			
				_	_						
,	-										
		_									
	-			-			·				
			I=Reduced Matrix, CS I LRRs, unless othe			ed Sand G		cation: PL=Pore Lining, M=Matrix. for Problematic Hydric Soils ³ :			
Histosol		icable to al	Sandy					fuck (A9) (LRR I, J)			
	pipedon (A2)			Redox (S				Prairie Redox (A16) (LRR F, G, H)			
	istic (A3)			d Matrix (surface (S7) (LRR G)			
Hydroge	en Sulfide (A4)				ineral (F1)			lains Depressions (F16)			
	d Layers (A5) (LRR				latrix (F2)		`	R H outside of MLRA 72 & 73)			
	uck (A9) (LRR F, G			ed Matrix				ed Vertic (F18)			
	d Below Dark Surfa ark Surface (A12)	ice (ATT)		Dark Surf ed Dark S	ace (F6) urface (F7)	١		arent Material (TF2) hallow Dark Surface (TF12)			
	Mucky Mineral (S1)			Depression		,		(Explain in Remarks)			
	Mucky Peat or Peat	(S2) (LRR			ressions (F	16)		of hydrophytic vegetation and			
5 cm Mu	ucky Peat or Peat (S3) (LRR F) (ML	.RA 72 &	73 of LRR	? H)	wetland hydrology must be present,				
Destrictive	/:f						unless	disturbed or problematic.			
	Layer (if present):										
Type:	ches):						Hydric Soil	Present? Yes No X			
Remarks:	CHES).						Tiyane 3011	rieseit: resNo			
Nemarks.											
Fill, surfa	ace is beginn	ing to sl	how signs of d	eplete	d matri	X					
				•							
HYDROLO											
_	drology Indicators										
	-	one require	ed; check all that appl					ry Indicators (minimum of two required)			
Surface			Salt Crust					ace Soil Cracks (B6)			
	ater Table (A2)		Aquatic In				✓ Sparsely Vegetated Concave Surface (B8)				
Saturatio			Hydrogen				Drainage Patterns (B10)				
	farks (B1) nt Deposits (B2)		Dry-Seaso				· · · · · · · · · · · · · · · · · · ·	dized Rhizospheres on Living Roots (C3) where tilled)			
	posits (B3)		·	not tilled		ing ixoots	. ,	/fish Burrows (C8)			
	at or Crust (B4)		Presence		•	4)		uration Visible on Aerial Imagery (C9)			
	posits (B5)		Thin Muck			,		morphic Position (D2)			
✓ Inundati	on Visible on Aeria	l Imagery (E					FAC	C-Neutral Test (D5)			
Water-S	Stained Leaves (B9)						Fros	st-Heave Hummocks (D7) (LRR F)			
Field Obser			.,								
Surface Wat			No X Depth (in								
Water Table			No X Depth (in					V			
Saturation P (includes car		Yes	No X Depth (in	ches):		Wet	land Hydrology	y Present? Yes X No			
		m gauge, m	nonitoring well, aerial	photos, p	revious ins	pections)	, if available:				
Remarks:											
Surface	water presen	t within	WET1, depth	less th	nan 1 in	١.					
	ļ. 233	•	,								

WETLAND DETERMINATION DATA FORM – Great Plains Region

Section Loca Loca slopes f year? Yently distur problema ng san impou , black ute Don yer Spe	on, Town I relief (of Yes X bed? atic? atic? atichelian Inded (Willo	No No Are " (If ne point le a Wetlar to cre w, and	eate pond. Pond now holds water yed hydrophytic forbes. Dominance Test worksheet: Number of Dominant Species That Are OBL FACW or FAC
Loca slopes f year? Y ntly distur problema ng san impou , black ute Don yer Spe	relief (control of the control of th	No No Are " (If ne point le sampled a Wetlan to cre w, and	convex, none): Concave Slope (%): 1 Long:
Loca slopes f year? Y ntly distur problema ng san impou , black ute Don yer Spe	relief (control of the control of th	No No Are " (If ne point le sampled a Wetlan to cre w, and	convex, none): Concave Slope (%): 1 Long:
impou, black	res X bed? atic? atic? aticheling Is the within unded willo	No Are " (If ne point le Sampled a Wetlan to cre W, and	NWI classification: POW/PSS (If no, explain in Remarks.) "Normal Circumstances" present? Yes X No eeded, explain any answers in Remarks.) locations, transects, important features, eate pond. Pond now holds water yed hydrophytic forbes. Dominance Test worksheet: Number of Dominant Species That Are OBL FACW or FAC
impou ty black	res X bed? atic? atic? sthe within anded within	No Are " (If ne point le Sampled a Wetlan to cre W, and	NWI classification: POW/PSS (If no, explain in Remarks.) "Normal Circumstances" present? Yes X No eeded, explain any answers in Remarks.) locations, transects, important features, eater and? Yes X No eater pond. Pond now holds water yed hydrophytic forbes. Dominance Test worksheet: Number of Dominant Species That Are OBL FACW or FAC
impou , black	res X bed? atic? atic? atic! Is the within unded willo	Are " (If ne point le sampled a Wetlar to cre W, and	(If no, explain in Remarks.) "Normal Circumstances" present? Yes X No eeded, explain any answers in Remarks.) locations, transects, important features, eate and? Yes X No eate pond. Pond now holds water yed hydrophytic forbes. Dominance Test worksheet: Number of Dominant Species That Are OBL FACW or FAC.
impou , black	Is the within unded willo	Are " (If ne point le Sampled a Wetlan to cre W, and	"Normal Circumstances" present? Yes X No_eeded, explain any answers in Remarks.) locations, transects, important features, eate and? Yes X No_eate pond. Pond now holds water yed hydrophytic forbes. Dominance Test worksheet: Number of Dominant Species That Are OBL FACW or FAC
impou , black	Is the within unded willo	yoint least point	eeded, explain any answers in Remarks.) locations, transects, important features, eater and? Yes X No
impou , black	Is the within unded willo	sampled a Wetlan to cre W, and	d Area nd? Yes X No eate pond. Pond now holds water yed hydrophytic forbes. Dominance Test worksheet: Number of Dominant Species That Are OBL FACW or FAC
impou , black ute Don yer Spe	Is the within	Sampled a Wetlan to cre W, and	d Area nd? Yes X No eate pond. Pond now holds water ye d hydrophytic forbes. Dominance Test worksheet: Number of Dominant Species That Are OBL FACW or FAC
impou , black ute Don ver Spe	within	to cre W, and	eate pond. Pond now holds water yed hydrophytic forbes. Dominance Test worksheet: Number of Dominant Species That Are OBL FACW or FAC
impou , black ute Don ver Spe	within	to cre W, and	eate pond. Pond now holds water yed hydrophytic forbes. Dominance Test worksheet: Number of Dominant Species That Are OBL FACW or FAC
impou , black ute Don ver Spe	inded willo	to cre W, and	eate pond. Pond now holds water yed hydrophytic forbes. Dominance Test worksheet: Number of Dominant Species That Are OBL FACW or FAC
, black	ninant In	w, and	Dominance Test worksheet: Number of Dominant Species That Are OBL FACW or FAC
, black	ninant In	w, and	Dominance Test worksheet: Number of Dominant Species That Are OBL FACW or FAC
ute Don ver Spe	ninant li	ndicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL FACW or FAC
ver Spe	cies?	Status	Number of Dominant Species That Are OBL_FACW_or FAC
ver Spe	cies?	Status	Number of Dominant Species That Are OBL_FACW_or FAC
			That Are OBL_FACW_or FAC
			That Are OBL, FACW, or FAC
			I (avaluding EAC). (A
			(excluding FAC-): 3 (A
			Total Number of Dominant Species Across All Strata: 3 (B
_			Species Across All Strata: 3 (B
= Tot	al Cove	r	Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A
Υ	F	FACW	That Ale OBL, FACW, OF FAC.
Υ	(OBL	Prevalence Index worksheet:
			Total % Cover of: Multiply by:
			OBL species x 1 =
			FACW species x 2 =
= Tot	al Cove	r	FAC species x 3 = FACU species x 4 =
Υ	(OBL	UPL species x 5 =
		FACU	Column Totals: (A) (
N		OBL	(1)
N	F	ACW	Prevalence Index = B/A =
N	F	FACW	Hydrophytic Vegetation Indicators:
			1 - Rapid Test for Hydrophytic Vegetation
			✓ 2 - Dominance Test is >50%
			3 - Prevalence Index is ≤3.0¹
			4 - Morphological Adaptations ¹ (Provide support data in Remarks or on a separate sheet)
			Problematic Hydrophytic Vegetation ¹ (Explain)
= Tot	al Cove	r	
			¹ Indicators of hydric soil and wetland hydrology mus be present, unless disturbed or problematic.
			Hadron basis
	al Cove		Hydrophytic Vegetation
= 100	ai oove	•	Present? Yes X No No
			1
	N N N	N F	N FACW N FACW = Total Cover

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SOIL Sampling Point: WET2

Depth						or confirm	n the absence	of indicators.)			
(in ab)	Matrix	0/		x Features		Loc ²	Tavt	Domestic			
(inches) 0-2	Color (moist) 10YR3/3	<u>%</u> <u>C</u> 100	olor (moist)	%	Type'	LOC	Texture Muck	Remarks Decomposing leaves, fine roots			
								Decomposing leaves, line roots			
2-18	2.5Y4/2						Silty sand				
	-			.							
				-							
	· ·	_									
-	· -										
				- <u> </u>							
	Concentration, D=De Indicators: (Appli	•				d Sand G		ation: PL=Pore Lining, M=Matrix. for Problematic Hydric Soils ³ :			
_		cable to all LNNs						•			
Histoso	Epipedon (A2)		Sandy (Redox (S5				luck (A9) (LRR I, J) Prairie Redox (A16) (LRR F, G, H)			
l '	listic (A3)			d Matrix (S				urface (S7) (LRR G)			
	en Sulfide (A4)			Mucky Mir				lains Depressions (F16)			
	ed Layers (A5) (LRR	F)		Gleyed Ma	, ,		_	R H outside of MLRA 72 & 73)			
1 cm M	uck (A9) (LRR F, G	, H)	Deplete	d Matrix (F	- 3)		Reduce	ed Vertic (F18)			
	ed Below Dark Surfa	ce (A11)	· · · · · · · · · · · · · · · · · · ·	Dark Surfa	. ,			arent Material (TF2)			
	Dark Surface (A12)			d Dark Su				hallow Dark Surface (TF12)			
	Mucky Mineral (S1) Mucky Peat or Peat	(C2) (I DD C U)		Depressionains Depre		16)		Explain in Remarks) of hydrophytic vegetation and			
	lucky Peat of Peat (. , ,	_	.RA 72 & 7				d hydrology must be present,			
3 6111 101	doky i cat of i cat (t	33) (LIKIT)	(1012		J OI LIKIK	••,	unless disturbed or problematic.				
Restrictive	Layer (if present):							·			
Type:											
Depth (in	nches):						Hydric Soil	Present? Yes X No			
Remarks:							l				
HYDROLO	201/										
	JGY										
	ydrology Indicators	s:									
Wetland Hy			ck all that appl	y)			Seconda	ry Indicators (minimum of two required)			
Wetland Hy	drology Indicators						·				
Wetland Hy Primary Indi ✓ Surface	ydrology Indicators icators (minimum of		ck all that appl Salt Crust Aquatic In	(B11)	s (B13)		Surf	ry Indicators (minimum of two required) ace Soil Cracks (B6) rsely Vegetated Concave Surface (B8)			
Wetland Hy Primary Indi ✓ Surface High W	ydrology Indicators icators (minimum of e Water (A1)		Salt Crust	(B11) vertebrate	, ,		Surf	ace Soil Cracks (B6)			
Wetland Hy Primary Indi ✓ Surface — High W. — Saturati	ydrology Indicators icators (minimum of water (A1) later Table (A2)		Salt Crust Aquatic In	(B11) vertebrate Sulfide Od	dor (C1)		Surf. ✓ Spai	ace Soil Cracks (B6) rsely Vegetated Concave Surface (B8)			
Wetland Hy Primary Indi ✓ Surface — High W. — Saturati — Water N	ydrology Indicators icators (minimum of e Water (A1) dater Table (A2) ion (A3)		Salt Crust Aquatic In Hydrogen	(B11) vertebrate Sulfide Od on Water T	dor (C1) able (C2)	ng Roots	Surf. ✓ Spai Drai Oxic	ace Soil Cracks (B6) rsely Vegetated Concave Surface (B8) nage Patterns (B10)			
Wetland Hy Primary Indi ✓ Surface — High W. — Saturati — Water M. — Sedime — Drift De	ydrology Indicators icators (minimum of water (A1) later Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3)		Salt Crust Aquatic In Hydrogen Dry-Seaso Oxidized F	(B11) vertebrate Sulfide Od on Water T	dor (C1) able (C2)	ng Roots	Surfi ✓ Spai Drai Oxio (C3) (w Cray	ace Soil Cracks (B6) rsely Vegetated Concave Surface (B8) nage Patterns (B10) lized Rhizospheres on Living Roots (C3) here tilled) rfish Burrows (C8)			
Wetland Hy Primary Indi ✓ Surface — High W. — Saturati — Water M — Sedime — Drift De	ydrology Indicators icators (minimum of w Water (A1) fater Table (A2) ion (A3) Warks (B1) ent Deposits (B2)		Salt Crust Aquatic In Hydrogen Dry-Seaso Oxidized F	(B11) vertebrate Sulfide Oco on Water T Rhizosphe not tilled)	dor (C1) able (C2) res on Livi		Surfi ✓ Spai Drai Oxio (C3) (w Cray	ace Soil Cracks (B6) rsely Vegetated Concave Surface (B8) nage Patterns (B10) lized Rhizospheres on Living Roots (C3) here tilled)			
Wetland Hy Primary Indi ✓ Surface — High W. — Saturati — Water M. — Sedime — Drift De — Algal M. — Iron De	ydrology Indicators icators (minimum of e Water (A1) later Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5)	one required; che	Salt Crust Aquatic In Hydrogen Dry-Seasc Oxidized F	(B11) vertebrate Sulfide Oco on Water T Rhizospher not tilled)	dor (C1) fable (C2) res on Livi d Iron (C4		Surfi.	ace Soil Cracks (B6) rsely Vegetated Concave Surface (B8) nage Patterns (B10) lized Rhizospheres on Living Roots (C3) here tilled) rfish Burrows (C8)			
Wetland Hy Primary Indi ✓ Surface — High W. — Saturati — Water N — Sedime — Drift De — Algal M — Iron De ✓ Inundat	ydrology Indicators icators (minimum of e Water (A1) later Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) tion Visible on Aerial	one required; che	Salt Crust Aquatic In Hydrogen Dry-Seasc Oxidized F (where I) Presence	(B11) vertebrate Sulfide Oc on Water T Rhizospher not tilled) of Reduce	dor (C1) rable (C2) res on Livi d Iron (C4 C7)		Surf. ✓ Spai — Drai — Oxio (C3) (w — Cray — Satu — Geo — FAC	ace Soil Cracks (B6) rsely Vegetated Concave Surface (B8) nage Patterns (B10) lized Rhizospheres on Living Roots (C3) here tilled) rfish Burrows (C8) rration Visible on Aerial Imagery (C9) morphic Position (D2) -Neutral Test (D5)			
Wetland Hy Primary Indi ✓ Surface — High W — Saturati — Water N — Sedime — Drift De — Algal M — Iron De ✓ Inundat — Water-S	ydrology Indicators icators (minimum of a Water (A1) fater Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) tion Visible on Aerial Stained Leaves (B9)	one required; che	Salt Crust Aquatic In Hydrogen Dry-Seasc Oxidized F (where I) Presence Thin Muck	(B11) vertebrate Sulfide Oc on Water T Rhizospher not tilled) of Reduce	dor (C1) rable (C2) res on Livi d Iron (C4 C7)		Surf. ✓ Spai — Drai — Oxio (C3) (w — Cray — Satu — Geo — FAC	ace Soil Cracks (B6) rsely Vegetated Concave Surface (B8) nage Patterns (B10) lized Rhizospheres on Living Roots (C3) here tilled) rfish Burrows (C8) rration Visible on Aerial Imagery (C9) morphic Position (D2)			
Wetland Hy Primary Indi ✓ Surface — High W. — Saturati — Water M. — Sedime — Drift De — Algal M. — Iron De ✓ Inundat — Water-S	ydrology Indicators icators (minimum of a Water (A1) fater Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) tion Visible on Aerial Stained Leaves (B9) rvations:	one required; che	Salt Crust Aquatic In Hydrogen Dry-Seasc Oxidized F (where in Presence Thin Muck Other (Exp	(B11) vertebrate Sulfide Oc on Water T Rhizospher not tilled) of Reduce s Surface (blain in Re	dor (C1) Table (C2) Tes on Livi d Iron (C4 C7) marks)		Surf. ✓ Spai — Drai — Oxio (C3) (w — Cray — Satu — Geo — FAC	ace Soil Cracks (B6) rsely Vegetated Concave Surface (B8) nage Patterns (B10) lized Rhizospheres on Living Roots (C3) here tilled) rfish Burrows (C8) rration Visible on Aerial Imagery (C9) morphic Position (D2) -Neutral Test (D5)			
Wetland Hy Primary Indi ✓ Surface — High W. — Saturati — Water M. — Sedime — Drift De — Algal M. — Iron De ✓ Inundat — Water-S Field Obsel Surface Wa	ydrology Indicators icators (minimum of wwater (A1) fater Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) tion Visible on Aerial Stained Leaves (B9) rvations: tter Present?	one required; che	Salt Crust Aquatic In Hydrogen Dry-Seasc Oxidized F (where in Presence Thin Muck Other (Exp	(B11) vertebrate Sulfide Oc on Water T Rhizosphei not tilled) of Reduce a Surface (blain in Re	dor (C1) rable (C2) res on Livi d Iron (C4 C7) marks)		Surf. ✓ Spai — Drai — Oxio (C3) (w — Cray — Satu — Geo — FAC	ace Soil Cracks (B6) rsely Vegetated Concave Surface (B8) nage Patterns (B10) lized Rhizospheres on Living Roots (C3) here tilled) rfish Burrows (C8) rration Visible on Aerial Imagery (C9) morphic Position (D2) -Neutral Test (D5)			
Wetland Hy Primary Indi ✓ Surface — High W. — Saturati — Water N. — Sedime — Drift De — Algal M. — Iron De ✓ Inundat — Water-S Field Obser Surface Water Table	ydrology Indicators icators (minimum of e Water (A1) later Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) tion Visible on Aerial Stained Leaves (B9) rvations: ter Present?	one required; che	Salt Crust Aquatic In Hydrogen Dry-Seasc Oxidized F (where I) Presence Thin Muck Other (Exp	(B11) vertebrate Sulfide Oco on Water T Rhizosphei not tilled) of Reduce a Surface (blain in Re ches):	dor (C1) rable (C2) res on Livi d Iron (C4 C7) marks)		Surfi. ✓ Spai Draii Oxio (C3) (w Cray Satu Geo FAC Fros	ace Soil Cracks (B6) rsely Vegetated Concave Surface (B8) nage Patterns (B10) lized Rhizospheres on Living Roots (C3) here tilled) rfish Burrows (C8) rration Visible on Aerial Imagery (C9) morphic Position (D2) -Neutral Test (D5) tt-Heave Hummocks (D7) (LRR F)			
Wetland Hy Primary Indi ✓ Surface — High W. — Saturati — Water N. — Sedime — Drift De — Algal M. — Iron De ✓ Inundat — Water-S Field Obser Surface Water Table Saturation F	ydrology Indicators icators (minimum of e Water (A1) later Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) tion Visible on Aerial Stained Leaves (B9) rvations: ter Present?	one required; che	Salt Crust Aquatic In Hydrogen Dry-Seasc Oxidized F (where I) Presence Thin Muck Other (Exp	(B11) vertebrate Sulfide Oco on Water T Rhizosphei not tilled) of Reduce a Surface (blain in Re ches):	dor (C1) rable (C2) res on Livi d Iron (C4 C7) marks)		Surfi. ✓ Spai Draii Oxio (C3) (w Cray Satu Geo FAC Fros	ace Soil Cracks (B6) rsely Vegetated Concave Surface (B8) nage Patterns (B10) lized Rhizospheres on Living Roots (C3) here tilled) rfish Burrows (C8) rration Visible on Aerial Imagery (C9) morphic Position (D2) -Neutral Test (D5)			
Wetland Hy Primary Indi ✓ Surface — High W. — Saturati — Water M. — Sedime — Drift De — Algal M. — Iron De ✓ Inundat — Water-S Field Obset Surface Water Table Saturation F (includes ca	ydrology Indicators icators (minimum of e Water (A1) later Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) tion Visible on Aerial Stained Leaves (B9) rvations: eter Present? Present?	one required; che I Imagery (B7) Yes No _X Yes _X No _ Yes _X No _	Salt Crust Aquatic In Hydrogen Dry-Seasc Oxidized F (where in Presence Thin Muck Other (Exp Depth (in Depth (in	(B11) vertebrate Sulfide Oco on Water T Rhizospher not tilled) of Reduce c Surface (blain in Re ches):	dor (C1) fable (C2) res on Livi d Iron (C4 C7) marks)		Surf. ✓ Spai — Oxio (C3) (w — Cray — Satu — Geo — FAC — Fros	ace Soil Cracks (B6) rsely Vegetated Concave Surface (B8) nage Patterns (B10) lized Rhizospheres on Living Roots (C3) here tilled) rfish Burrows (C8) rration Visible on Aerial Imagery (C9) morphic Position (D2) -Neutral Test (D5) tt-Heave Hummocks (D7) (LRR F)			
Wetland Hy Primary Indi ✓ Surface — High W. — Saturati — Water M. — Sedime — Drift De — Algal M. — Iron De ✓ Inundat — Water-S Field Obser Surface War Water Table Saturation F (includes ca	ydrology Indicators icators (minimum of e Water (A1) later Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) tion Visible on Aerial Stained Leaves (B9) rvations: ter Present? e Present? epillary fringe)	one required; che I Imagery (B7) Yes No _X Yes _X No _ Yes _X No _	Salt Crust Aquatic In Hydrogen Dry-Seasc Oxidized F (where in Presence Thin Muck Other (Exp Depth (in Depth (in	(B11) vertebrate Sulfide Oco on Water T Rhizospher not tilled) of Reduce c Surface (blain in Re ches):	dor (C1) fable (C2) res on Livi d Iron (C4 C7) marks)		Surf. ✓ Spai — Oxio (C3) (w — Cray — Satu — Geo — FAC — Fros	ace Soil Cracks (B6) rsely Vegetated Concave Surface (B8) nage Patterns (B10) lized Rhizospheres on Living Roots (C3) here tilled) rfish Burrows (C8) rration Visible on Aerial Imagery (C9) morphic Position (D2) -Neutral Test (D5) tt-Heave Hummocks (D7) (LRR F)			
Wetland Hy Primary Indi ✓ Surface — High W. — Saturati — Water M. — Sedime — Drift De — Algal M. — Iron De ✓ Inundat — Water-S Field Obsel Surface Water Table Saturation F (includes ca	ydrology Indicators icators (minimum of e Water (A1) later Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) tion Visible on Aerial Stained Leaves (B9) rvations: ter Present? e Present? epillary fringe)	one required; che I Imagery (B7) Yes No _X Yes _X No _ Yes _X No _	Salt Crust Aquatic In Hydrogen Dry-Seasc Oxidized F (where in Presence Thin Muck Other (Exp Depth (in Depth (in	(B11) vertebrate Sulfide Oco on Water T Rhizospher not tilled) of Reduce c Surface (blain in Re ches):	dor (C1) fable (C2) res on Livi d Iron (C4 C7) marks)		Surf. ✓ Spai — Oxio (C3) (w — Cray — Satu — Geo — FAC — Fros	ace Soil Cracks (B6) rsely Vegetated Concave Surface (B8) nage Patterns (B10) lized Rhizospheres on Living Roots (C3) here tilled) rfish Burrows (C8) rration Visible on Aerial Imagery (C9) morphic Position (D2) -Neutral Test (D5) tt-Heave Hummocks (D7) (LRR F)			
Wetland Hy Primary Indi ✓ Surface — High W. — Saturati — Water M. — Sedime — Drift De — Algal M. — Iron De ✓ Inundat — Water-S Field Obser Surface War Water Table Saturation F (includes ca	ydrology Indicators icators (minimum of e Water (A1) later Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) tion Visible on Aerial Stained Leaves (B9) rvations: ter Present? e Present? epillary fringe)	one required; che I Imagery (B7) Yes No _X Yes _X No _ Yes _X No _	Salt Crust Aquatic In Hydrogen Dry-Seasc Oxidized F (where in Presence Thin Muck Other (Exp Depth (in Depth (in	(B11) vertebrate Sulfide Oco on Water T Rhizospher not tilled) of Reduce c Surface (blain in Re ches):	dor (C1) fable (C2) res on Livi d Iron (C4 C7) marks)		Surf. ✓ Spai — Oxio (C3) (w — Cray — Satu — Geo — FAC — Fros	ace Soil Cracks (B6) rsely Vegetated Concave Surface (B8) nage Patterns (B10) lized Rhizospheres on Living Roots (C3) here tilled) rfish Burrows (C8) rration Visible on Aerial Imagery (C9) morphic Position (D2) -Neutral Test (D5) tt-Heave Hummocks (D7) (LRR F)			

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Wilcox Superfund Site		(City/Cou	unty: Bristow		Sampli	ng Date: 9/22	/2016
Applicant/Owner: EPA							Sampling Point: WET3	
Investigator(s): K. Rigney, S. Gilrein		;			nge:			
Landform (hillslope, terrace, etc.): Hil					convex, none): Cor			%): ²
Subregion (LRR): LRR J (Southwester								
Soil Map Unit Name: Bigheart-Niotaze								
Are climatic / hydrologic conditions or								
Are Vegetation, Soil $\frac{X}{X}$, or					'Normal Circumstan			No
Are Vegetation, Soil, Coll, Soil, Coll, Coll					eeded, explain any a			110
							,	
SUMMARY OF FINDINGS –	Attach site map	showing	samp	oling point l	ocations, trans	ects, impo	rtant featu	res, etc.
Hydrophytic Vegetation Present?	Yes X	No		s the Sampled	Avaa			
Hydric Soil Present?	Yes X	No		s the Sampled vithin a Wetlar		X No	n	
Wetland Hydrology Present?	Yes X	No		vitiliii a vvetiai	10: 103			
Remarks:								
VEGETATION – Use scientif	ic names of pla	nts.						
		Absolute	Domin	nant Indicator	Dominance Test	worksheet:		
Tree Stratum (Plot size:)	% Cover	Specie	es? Status	Number of Domir	ant Species		
1					That Are OBL, FA		1	(A)
2					(excluding FAC-)	•	-	(A)
3					Total Number of I		1	(B)
4					Species Across A	iii Siiaia.	-	(D)
Sapling/Shrub Stratum (Plot size:)		= I otal	Cover	Percent of Domin That Are OBL, FA		100	(A/B)
1					That Are OBE, 17	NOVV, OI 1 AC.		(٨/٥)
2.					Prevalence Inde			
3						er of:		
4					OBL species _			
5					FACW species _			
	,		= Total	Cover	FAC species _ FACU species			
Herb Stratum (Plot size:)	50	Υ	OBL	UPL species _			
2. Eupatorium perfoliatum			N	FACW	Column Totals: _			
3. Carex spp.		30	N		Ooldmin Totals	(/		(D)
4 Actor con		5	N			Index = $B/A =$		
5					Hydrophytic Veg	•		
6					1 - Rapid Tes			1
7.					✓ 2 - Dominano			
8.					3 - Prevalence			
9					4 - Morpholo	gical Adaptation Smarks or on a	ons' (Provide s Lsenarate she	supporting et)
10					Problematic		•	•
		90	= Total	Cover				
Woody Vine Stratum (Plot size:					¹ Indicators of hyd be present, unles			gy must
1 2					Hydrophytic			
2.					Vegetation	.,		
% Bare Ground in Herb Stratum 10					Present?	Yes X	No	<u>-</u>
Remarks:								
Black willow saplings pre	esent in other	portions	of the	e wetland.				

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SOIL Sampling Point: WET3

Profile Desc	ription: (Describe	to the depth	needed to docur	nent the i	ndicator	or confirm	n the absence	of indicators.)			
Depth	Matrix			x Feature:							
(inches)	Color (moist)		Color (moist)	<u>%</u>	Type ¹	Loc ²	<u>Texture</u>	Remarks			
0-2	10YR3/2	_ 100					Silty Organic	Roots			
2-6	10YR6/2	100					Silty Sand	Gravel			
											
	oncentration, D=Dep					d Sand Gr		cation: PL=Pore Lining, M=Matrix.			
-	Indicators: (Applic	cable to all LR						for Problematic Hydric Soils ³ :			
Histosol				Sleyed Ma				Muck (A9) (LRR I, J)			
Histic Ep	oipedon (A2)			Redox (S5 I Matrix (S				Prairie Redox (A16) (LRR F, G, H) Surface (S7) (LRR G)			
	n Sulfide (A4)			Mucky Mir				Plains Depressions (F16)			
	d Layers (A5) (LRR	F)		Gleyed Ma			_	RR H outside of MLRA 72 & 73)			
	ıck (A9) (LRR F, G,			d Matrix (I			Reduc	ed Vertic (F18)			
	d Below Dark Surfac	ce (A11)		Dark Surfa	. ,			arent Material (TF2)			
·	ark Surface (A12)				rface (F7)			shallow Dark Surface (TF12)			
	fucky Mineral (S1)	(CO) (I DD C		Depression	. ,	16)		(Explain in Remarks)			
	Mucky Peat or Peat licky Peat or Peat (S				essions (F ⁻ 73 of LRR			of hydrophytic vegetation and dhydrology must be present,			
0 0111 1010	iony i cat of i cat (c	o) (Litti)	(IIIL		O OI LIKIK	•••		disturbed or problematic.			
Restrictive I	_ayer (if present):							·			
Type: Co	arse gravel		_								
Depth (inc	ches): <u>6</u>		<u> </u>				Hydric Soil	Present? Yes X No No			
Remarks:							•				
Full soil r	orofile could r	not he obt	ained due to	restri	rtive la	ver					
						y 01.					
HYDROLO	GY										
Wetland Hyd	drology Indicators	:									
Primary India	cators (minimum of	one required; o	check all that apply	y)			Seconda	ary Indicators (minimum of two required)			
✓ Surface			Salt Crust					ace Soil Cracks (B6)			
	iter Table (A2)		Aquatic Inv				Sparsely Vegetated Concave Surface (B8)				
✓ Saturation	` ,		Hydrogen		. ,			inage Patterns (B10)			
	arks (B1)		Dry-Seaso					dized Rhizospheres on Living Roots (C3)			
	nt Deposits (B2)		Oxidized F		res on Livi	ng Roots	. , , ,	where tilled)			
	oosits (B3)			not tilled)	d Iron (CA	1)		yfish Burrows (C8) uration Visible on Aerial Imagery (C9)			
	at or Crust (B4) posits (B5)		Presence of Thin Muck			')	·	omorphic Position (D2)			
	on Visible on Aerial	Imagery (B7)	Other (Exp	,	,			C-Neutral Test (D5)			
	tained Leaves (B9)	imagery (Dr)	Outer (EXP	nam m rec	markoj		·	st-Heave Hummocks (D7) (LRR F)			
Field Obser								2.77 (2.11.17)			
Surface Water		res X No	Depth (inc	ches): 0							
Water Table			Depth (inc			_					
Saturation P			Depth (inc			Wetl	and Hydrolog	y Present? Yes X No			
(includes cap	oillary fringe)										
Describe Re	corded Data (strean	n gauge, moni	toring well, aerial p	onotos, pr	evious ins	pections),	it available:				
Damarica											
Remarks:											

WETLAND DETERMINATION DATA FORM – Great Plains Region

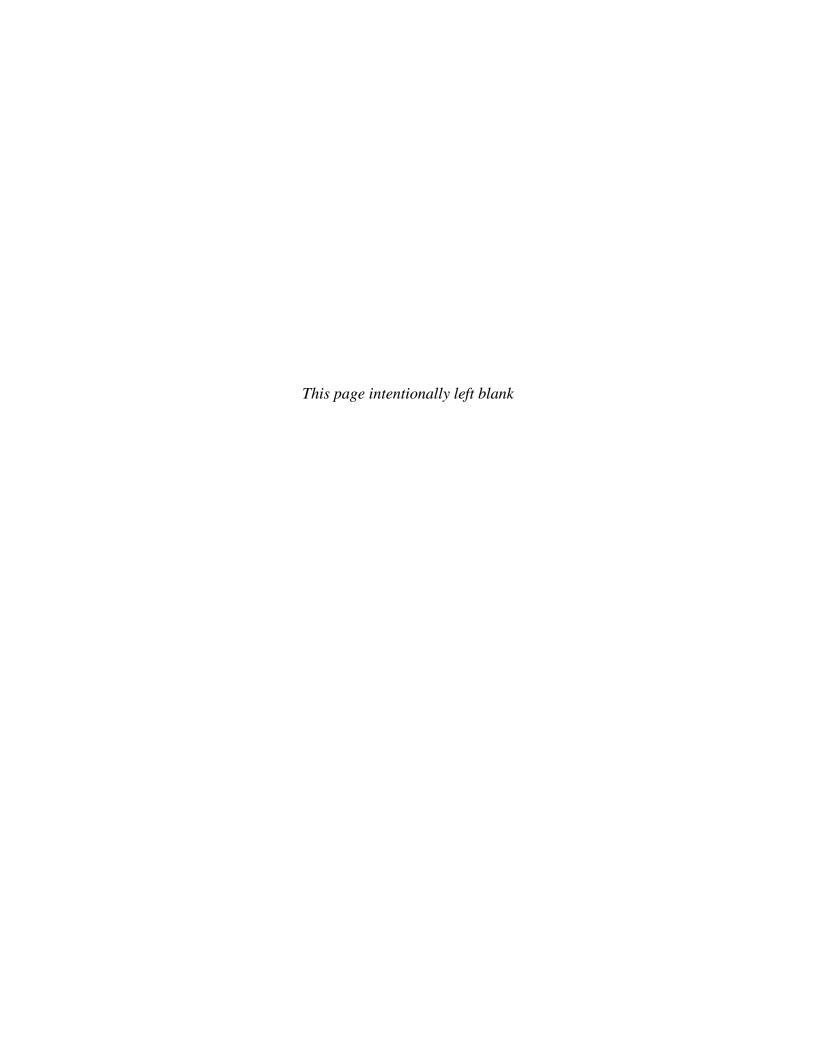
Project/Site: Wilcox Superfund Site	(City/County:	Bristow		Samplin	g Date: 9/21	/2016
Applicant/Owner: EPA				State: OK Sam		npling Point: WET4	
Investigator(s): K. Rigney, S. Gilrein		Section, Tov	vnship, Ra	nge:			
Landform (hillslope, terrace, etc.): Hilly							
Subregion (LRR): LRR J (Southwestern Prairies)							
Soil Map Unit Name: Port fine sandy loam, 0 to 1 pe							
Are climatic / hydrologic conditions on the site typic							
Are Vegetation, Soil X, or Hydrology _				'Normal Circumstances			No
Are Vegetation, Soil, or Hydrology _				eeded, explain any ansv			110
SUMMARY OF FINDINGS – Attach site			•			ŕ	res etc
			y point i		,	tarit routu	
Hydrophytic Vegetation Present? Yes X Hydric Soil Present? Yes X	No No		e Sampled				
	No	withi	n a Wetlar	nd? Yes X	No		
Remarks:							
VEGETATION – Use scientific names of	of plants.						
TEGET/THOSE GOODINING HAMIOS	Absolute	Dominant	Indicator	Dominance Test wo	rkshoot.		
<u>Tree Stratum</u> (Plot size: 25'		Species?		Number of Dominant			
1. Ulmus rubra	2	N	FACU	That Are OBL, FACV		4	
2. Betula nigra	10	<u>Y</u>	FACW	(excluding FAC-):		4	(A)
3				Total Number of Dom		4	
4				Species Across All S	trata:	4	(B)
Sapling/Shrub Stratum (Plot size: 25'	12	= Total Cov	er	Percent of Dominant		100	
1. Platanus occidentalis) 5	Υ	FAC	That Are OBL, FACV	/, or FAC:	100	(A/B)
2. Betula nigra	5	Υ	FACW	Prevalence Index w	orksheet:		
3				Total % Cover of	<u>: </u>	Multiply by:	<u>:</u>
4.				OBL species	x	1 =	
5.				FACW species			
	4.0	= Total Cov	er	FAC species			
Herb Stratum (Plot size: 5'				FACU species			
1. Equisetum spp.	15	N		UPL species			
2. Carex spp.		N		Column Totals:	(A)	(B)
3. Pluchea odorata	5	-	FACW	Prevalence Inde	ex = B/A =		
4				Hydrophytic Vegeta			
5				1 - Rapid Test fo	r Hydrophyt	ic Vegetation	1
6				✓ 2 - Dominance T	est is >50%)	
7				3 - Prevalence Ir	ndex is ≤3.0	1	
8 9				4 - Morphologica	l Adaptation	ns ¹ (Provide s	supporting
10				data in Rema			
10.	20	= Total Cov	er	Problematic Hyd	rophytic Ve	getation (Exp	plain)
Woody Vine Stratum (Plot size:	_)			¹ Indicators of hydric s be present, unless di			gy must
2.				Hydrophytic			
		= Total Cov		Vegetation	. Y		
% Bare Ground in Herb Stratum 70				Present?	res _^	No	_
Remarks:							

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SOIL Sampling Point: WET4

	Color (moist)	0/		ox Featur	es Type ¹	Loc ²	Texture	Domorko	
(inches) 0-12	7.5YR3/4	<u>%</u> 85	Color (moist) 2.5YR4/8	<u>%</u> 15	C Type	M	sandy loam	Remarks	
12-16	7.5YR5/2		7.5YR3/1	_ 15 15	- C	M	·	darker color was clay	
12-10	7.51K5/2		7.5185/1	_ 15		IVI	silty sand	darker color was clay	
	_								
		•	M=Reduced Matrix, C			ed Sand G		cation: PL=Pore Lining, M=Matrix. for Problematic Hydric Soils ³ :	
Histose					latrix (S4)		1 cm Muck (A9) (LRR I, J)		
	Epipedon (A2)			Redox (S				Prairie Redox (A16) (LRR F, G, H)	
	Histic (A3)			ed Matrix (Surface (S7) (LRR G)	
	gen Sulfide (A4)	. =\			ineral (F1)		_	Plains Depressions (F16)	
	ed Layers (A5) (LRF /luck (A9) (LRR F, G			ed Matrix	Matrix (F2)		`	RR H outside of MLRA 72 & 73) ed Vertic (F18)	
	ed Below Dark Surfa			Dark Surf	. ,			arent Material (TF2)	
	Dark Surface (A12)				urface (F7)		Shallow Dark Surface (TF12)	
	Mucky Mineral (S1)			Depressi	. ,			(Explain in Remarks)	
	Mucky Peat or Pea Mucky Peat or Peat (ressions (F 73 of LRF			of hydrophytic vegetation and dhydrology must be present,	
5 CIII N	nucky real of real (33) (LKK I	(WII	LNA 12 Q	73 OI LKI	х п)		d flydrology flidst be present, disturbed or problematic.	
octrictive	Layer (if present):							<u> </u>	
resulctive	, , ,								
Type: _									
Type: Depth (i							Hydric Soil	Present? Yes No	
Туре: _							Hydric Soil	Present? Yes No	
Type: Depth (i Remarks:	nches):						Hydric Soil	Present? Yes No	
Type: Depth (i	nches):						Hydric Soil	Present? Yes No	
Type: Depth (i Remarks: YDROL(nches):OGY	s:		oly)					
Type: Depth (i Remarks: YDROLO Vetland H Primary Inc	nches):OGY	s:					Seconda	Present? Yes No ary Indicators (minimum of two required face Soil Cracks (B6)	
Type: Depth (i Remarks: YDROLO Vetland H Primary Inc Surfac	nches):OGY ydrology Indicator dicators (minimum of	s:	ed; check all that app Salt Crus		es (B13)		Seconda Sur	ary Indicators (minimum of two required	
Type: Depth (i Remarks: YDROL(Vetland H Primary Inc Surfac. /_ High W	OGY ydrology Indicator dicators (minimum of	s:	ed; check all that app Salt Crus Aquatic Ir Hydroger	it (B11) nvertebrat n Sulfide C	Odor (C1)		Seconda Sur _∕ Spa Dra	ary Indicators (minimum of two required face Soil Cracks (B6) Irsely Vegetated Concave Surface (B8) Inage Patterns (B10)	
Type: Depth (i Remarks: YDROLO Vetland H Primary Inc Surfac /_ High W Satura Water	OGY ydrology Indicator dicators (minimum of e Water (A1) Vater Table (A2) tion (A3) Marks (B1)	s:	ed; check all that app Salt Crus Aquatic Ir Hydroger Dry-Seas	nvertebrat Sulfide Con Water	Odor (C1) Table (C2)		Seconda Sur Spa Dra Oxi	ary Indicators (minimum of two required face Soil Cracks (B6) irsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C	
Type: Depth (i Remarks: YDROLO Vetland H Primary Inc Surfac High W Satura Water Sedime	DGY ydrology Indicator dicators (minimum of e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2)	s:	ed; check all that app Salt Crus Aquatic Ir Hydroger Dry-Seas Oxidized	nvertebrat n Sulfide Con Water Rhizosph	Odor (C1) Table (C2) eres on Liv		Seconda Sur ✓ Spa — Dra — Oxi (C3)	ary Indicators (minimum of two required face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) arinage Patterns (B10) dized Rhizospheres on Living Roots (C	
Type: Depth (i Remarks: YDROLO Vetland H Primary Inc Surfac High W Satura Water Sedime Drift De	DGY ydrology Indicator dicators (minimum of e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3)	s:	ed; check all that app Salt Crus Aquatic Ir Hydroger Dry-Seas Oxidized (where	nvertebrat n Sulfide C son Water Rhizosph not tilled	Odor (C1) Table (C2) eres on Liv	ring Roots	Seconda Sur ✓ Spa — Dra — Oxi (C3) (v — Cra	ary Indicators (minimum of two required face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) arsely Patterns (B10) dized Rhizospheres on Living Roots (Control of the control of th	
Type: Depth (i Remarks: YDROLO Wetland H Primary Inc Surfac High W Satura Water Sedime Drift De Algal N	DGY ydrology Indicator dicators (minimum of e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Mat or Crust (B4)	s:	ed; check all that app Salt Crus Aquatic Ir Hydroger Dry-Seas Oxidized (where	ot (B11) Invertebrate In Sulfide Coon Water Rhizosph In not tilled In Green Green	Odor (C1) Table (C2) eres on Liv I) ed Iron (C-	ring Roots	Seconda Sur Spa Dra Oxi (C3) (v Cra Sat	ary Indicators (minimum of two required face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (Concert tilled) yfish Burrows (C8) uration Visible on Aerial Imagery (C9)	
Type: Depth (i Remarks: YDROLO Vetland H Primary Inc Surfac / High W Satura _ Water _ Sedim _ Drift Do _ Algal N _ Iron De	nches):	s: í one requir	ed; check all that app Salt Crus Aquatic Ir Hydroger Dry-Seas Oxidized (where Presence Thin Muc	t (B11) nvertebrat n Sulfide C con Water Rhizosph not tilled e of Reduce	Odor (C1) Table (C2) eres on Liv I) eed Iron (C- (C7)	ring Roots	Seconda Sur ✓ Spa — Dra — Oxi (C3) (v — Cra — Sat — Geo	ary Indicators (minimum of two required face Soil Cracks (B6) ursely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (Concertilled) yfish Burrows (C8) uration Visible on Aerial Imagery (C9) omorphic Position (D2)	
Type: Depth (i Remarks: YDROLO Vetland H Primary Inc Surfac High W Satura Water Sedime Drift De Algal N Iron De Inunda	DGY ydrology Indicator dicators (minimum of e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Mat or Crust (B4)	s: f one requir	ed; check all that app Salt Crus Aquatic Ir Hydroger Dry-Seas Oxidized (where Presence	t (B11) nvertebrat n Sulfide C con Water Rhizosph not tilled e of Reduce	Odor (C1) Table (C2) eres on Liv I) eed Iron (C- (C7)	ring Roots	Seconda Sur ✓ Spa — Dra — Oxi (C3) (v — Cra — Sat — Gec — FAC	ary Indicators (minimum of two required face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (Concave tilled) yfish Burrows (C8) uration Visible on Aerial Imagery (C9)	
Type: Depth (i Remarks: YDROLO Vetland H Primary Inc Surfac / High W Satura _ Water _ Sedim _ Drift Do _ Algal N _ Iron Do _ Inunda _ Water-	pogy ydrology Indicator dicators (minimum of e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Mat or Crust (B4) eposits (B5) ation Visible on Aeria Stained Leaves (B9 ervations:	s: f one requir al Imagery (ed; check all that app Salt Crus Aquatic Ir Hydroger Dry-Seas Oxidized (where Presence Thin Muc B7) Other (Ex	t (B11) nvertebrat Sulfide Con Water Rhizosph not tilled of Reduct k Surface k plain in R	Odor (C1) Table (C2) eres on Liv odor (C1) eres on C1 ced Iron (C2) eres on C2 ced Iron (C3) eres or C4 ced Iron (C4)	ring Roots	Seconda Sur ✓ Spa — Dra — Oxi (C3) (v — Cra — Sat — Gec — FAC	ary Indicators (minimum of two required face Soil Cracks (B6) ursely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (Cyhere tilled) urfish Burrows (C8) uration Visible on Aerial Imagery (C9) omorphic Position (D2) C-Neutral Test (D5)	
Type: Depth (i Remarks: YDROL(Wetland H Primary Inc Surfac High W Satura Water Sedime Drift De Algal N Iron De Inunda Water- Field Obse	DGY ydrology Indicator dicators (minimum of e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Mat or Crust (B4) eposits (B5) ation Visible on Aeria Stained Leaves (B9 ervations: ater Present?	s: f one requir Il Imagery (ed; check all that app Salt Crus Aquatic Ir Hydroger Dry-Seas Oxidized (where Presence Thin Muc B7) Other (Ex	t (B11) nvertebrat n Sulfide Con Water Rhizosph not tilled e of Reduce k Surface xplain in R	Odor (C1) Table (C2) eres on Liv ced Iron (C- (C7) emarks)	ring Roots	Seconda Sur ✓ Spa — Dra — Oxi (C3) (v — Cra — Sat — Gec — FAC	ary Indicators (minimum of two required face Soil Cracks (B6) ursely Vegetated Concave Surface (B8) urage Patterns (B10) dized Rhizospheres on Living Roots (Curhere tilled) urfish Burrows (C8) uration Visible on Aerial Imagery (C9) umorphic Position (D2) C-Neutral Test (D5)	
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Appendix C PHOTO LOG



Wetland Delineation Photographs Wilcox Oil Company Superfund Site Photos Taken September 2016



Photograph 1: WUS2 facing west at confluence with WUS1



Photograph 2: WUS2 facing west east of railroad crossing



Photograph 3: WUS3 facing south



Photograph 4: Wetland 1 facing east



Photograph 5: Wetland 2 facing southwest



Photograph 7: Wetland 4 facing north



Photograph 6: WUS4 facing northwest



Photograph 8: WUS5 facing south



Photograph 9: Overflow replacement between impoundment and WUS5



Photograph 11: WET3 facing northwest



Photograph 10: WUS6 facing east